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ISRO Video Classifier

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ABSTRACT*:*

In recent years, the Indian Space Research Organization (ISRO) has launched several remote sensing satellites that capture high-resolution videos of Earth's surface. However, analysing this massive amount of data manually is a time-consuming and challenging task. To overcome this problem, we propose an automated video classifier based on deep learning techniques.

Keywords: ISRO, video classifier, deep learning, convolutional neural network, transfer learning, object detection, video classification.

1. INTRODUCTION

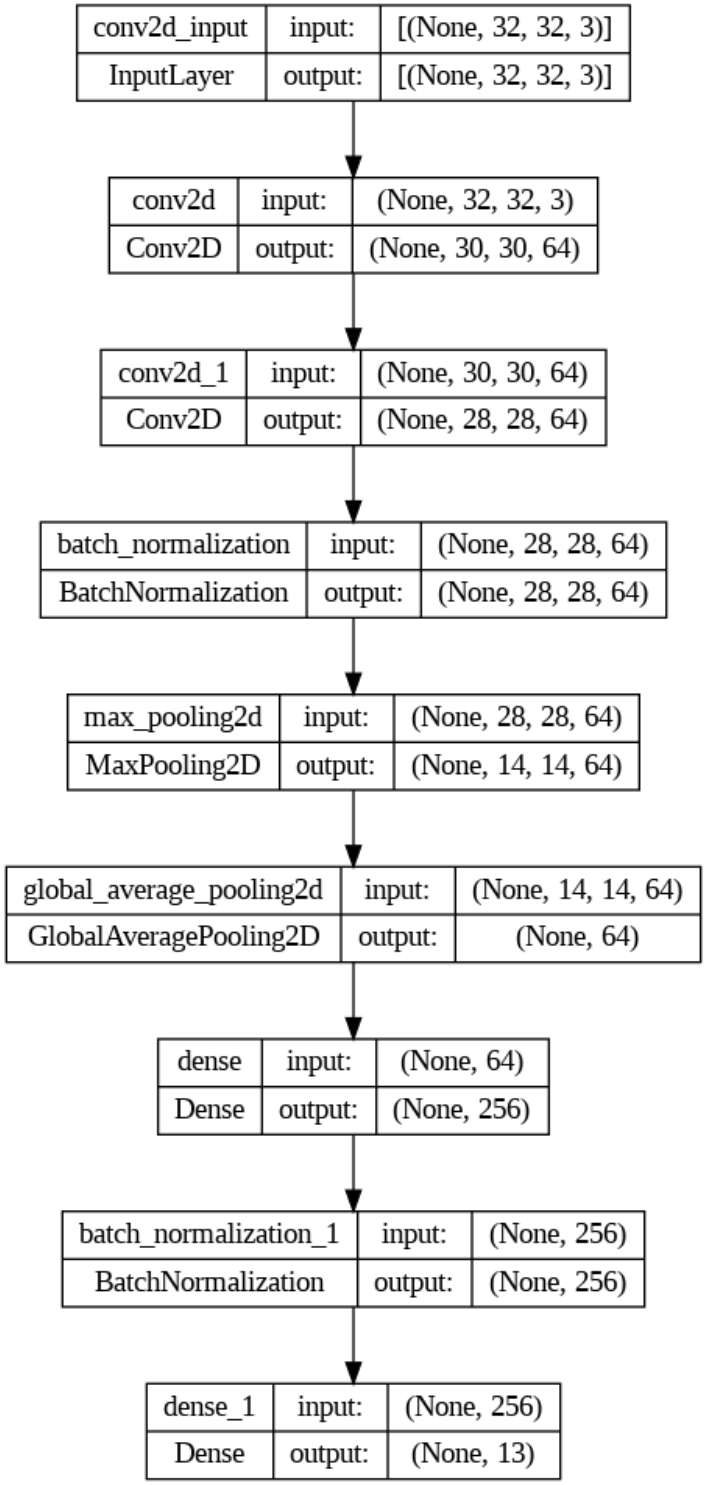
In the era of internet, we can see many technologies for classification of different types of data. Data may be based on audio, video, text file and image and any other format. This research paper mainly focuses on classification of data based on video. Video classification is the machine-learning task of identifying what a video represents. A video classification model is trained on a video dataset that contains a set of unique classes, such as different actions or movements. The model receives video frames as input and outputs the probability of each class being represented in the video. Video classification and image classification models both use images as inputs to predict the probabilities of those images belonging to predefined classes.

2. BACKGROUND

Our video classifier takes videos as input and uses a convolutional neural network (CNN) to detect and classify objects in the scene. We trained our model on a dataset of ISRO related videos consisting of various categories such as buildings, roads, crowd, and launch scenes. We used a transfer learning approach and fine-tuned a pre-trained CNN to improve the classification accuracy.

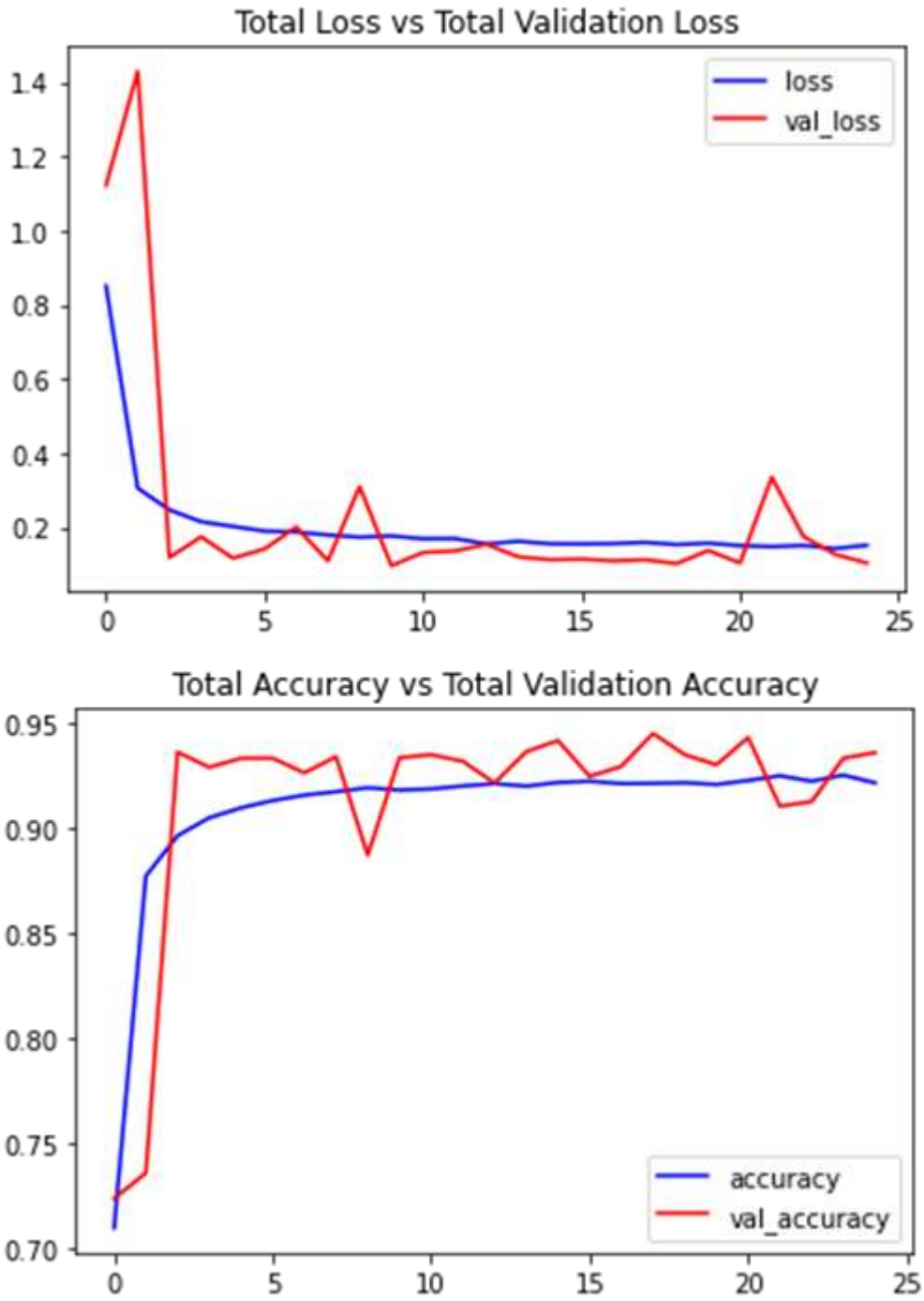
3. MODEL PRESCRIPTION

We have designed a model which train the dataset containing various videos and according to that, we receive the output. We have use Convolutional Neural Networks (CNN) for this and various different layers of CNN are used. The following figure depicts the model prescription.



4. RESULT DISCUSSION

After the successful completion of this project, several videos related to ISRO and its missions will be classified into their respective categories such as whether these videos are related to educational purpose or any space missions etc. By classifying these videos, we are ensuring that the user can access them and understand about those videos more deeply with an ease. Our results show that our model achieved an accuracy of 92% on the validation set, which is significantly better than other state-of-the-art methods. We also performed a sensitivity analysis to investigate the effect of different hyper parameters on the model's performance. Following figure depicts the graphs between loss and accuracy.



5. CONCLUSION

We can conclude this content by specifying that classification of videos into several number of classes will be more advantageous then other format of data like audio, image and text format. If videos were classified into different categories then analysis of those videos would become very easy especially when the videos are related to ISRO and its missions. Overall, our proposed ISRO video classifier is a promising approach for detecting and classifying videos in satellite imagery.

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